

What is claimed is:

1. A pattern forming method, comprising the steps of:
forming a first resist pattern containing a photo-acid generating agent on a substrate;
irradiating light to an exposed surface of the first resist pattern;
coating a resist film containing a cross-linking agent, which reacts with acid, on the substrate after irradiation of the light in a state where it covers the first resist pattern;
causing a cross-linking reaction at an interface between the first resist pattern and the resist film to grow a cross-linked layer; and
forming a second resist pattern made of the cross-linked layer and the first resist pattern.
2. A pattern forming method according to claim 1, wherein the light is one selected from the group consisting of ArF excimer laser light and KrF excimer laser light.
3. A pattern forming method according to claim 1, wherein a base resin of a resist material forming the first resist pattern containing the photo-acid generating agent is one selected from the group consisting of methacrylic resin and cycloolefin resin.
4. A pattern forming method according to claim 1, wherein a base resin of the resist film containing the cross-linking agent, which reacts with the acid, is one selected from the

group consisting of polyvinyl alcohol system resin, polyacrylic acid system resin, and polyvinyl acetal system resin.